

What is claimed is:

<sup>Sub 171</sup> 1. An isolated nucleic acid fragment comprising a nucleic acid sequence encoding all or part of lysine ketoglutarate reductase.

2. The nucleic acid fragment of Claim 1 wherein the nucleic acid sequence encodes a polypeptide essentially similar to the polypeptide described by SEQ ID NO:104, SEQ ID NO:105, SEQ ID NO:112, SEQ ID NO:117, SEQ ID NO:118, SEQ ID NO:121, SEQ ID NO:122, SEQ ID NO:124, SEQ ID NO:126, SEQ ID NO:128, SEQ ID NO:130 or SEQ ID NO:132.

3. The nucleic acid fragment of Claim 1 comprising a nucleic acid sequence wherein the nucleic acid sequence is essentially similar to that of SEQ ID NO:110, SEQ ID NO:111, SEQ ID NO:115, SEQ ID NO:116, SEQ ID NO:119, SEQ ID NO:120, SEQ ID NO:123, SEQ ID NO:125, SEQ ID NO:127, SEQ ID NO:129 or SEQ ID NO:131.

<sup>Sub 172</sup> 4. The nucleic acid fragment of Claim 1 comprising a nucleic acid sequence of SEQ ID NO:110, SEQ ID NO:111, SEQ ID NO:115, SEQ ID NO:116, SEQ ID NO:119, SEQ ID NO:120, SEQ ID NO:123, SEQ ID NO:125, SEQ ID NO:127, SEQ ID NO:129 or SEQ ID NO:131.

5. The nucleic acid fragment of Claim 1 wherein the nucleic acid sequence encodes a polypeptide as set forth in SEQ ID NO:104, SEQ ID NO:105, SEQ ID NO:112, SEQ ID NO:117, SEQ ID NO:118, SEQ ID NO:121, SEQ ID NO:122, SEQ ID NO:124, SEQ ID NO:126, SEQ ID NO:128, SEQ ID NO:130 or SEQ ID NO:132.

6. A chimeric gene comprising the isolated nucleic acid fragment of Claim 1 encoding lysine ketoglutarate reductase or a subfragment thereof, operably linked to suitable seed-specific regulatory sequences wherein said chimeric gene reduces lysine ketoglutarate reductase activity in seeds of plants transformed with the chimeric gene.

7. The chimeric gene according to Claim 6 wherein the isolated nucleic acid fragment comprises a nucleic acid sequence or subsequence thereof essentially similar to that of SEQ ID NO:110, SEQ ID NO:111, SEQ ID NO:115, SEQ ID NO:116, SEQ ID NO:119, SEQ ID NO:120, SEQ ID NO:123, SEQ ID NO:125, SEQ ID NO:127, SEQ ID NO:129 or SEQ ID NO:131.

8. A plant cell wherein lysine ketoglutarate reductase activity is reduced due to a mutation in a gene encoding lysine ketoglutarate reductase.

<sup>Sub 173</sup> 9. A plant cell transformed with the chimeric gene of Claim 6 or 7 wherein said transformed plant cell has reduced lysine ketoglutarate reductase activity.

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10. A plant seed wherein lysine ketoglutarate reductase activity is reduced due to a mutation in a gene encoding lysine ketoglutarate reductase.
- 3 JB 73 11. A plant seed transformed with the chimeric gene of Claim 6 or 7 wherein said transformed plant seed has reduced lysine ketoglutarate reductase activity.
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12. The plant cell according to Claim 9 wherein said plant cell is selected from the group of plants consisting of *Arabidopsis*, corn, soybean, rapeseed, wheat and rice.
13. The plant seed according to Claim 11 wherein said plant cell is selected from the group of plants consisting of *Arabidopsis*, corn, soybean, rapeseed, wheat and rice.
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14. A method for reducing lysine ketoglutarate reductase activity in a plant seed which comprises:
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- (a) transforming plant cells with the chimeric gene of claim 6 or 7;
  - (b) regenerating fertile mature plants from the transformed plant cells obtained from step (a) under conditions suitable to obtain seeds;
  - (c) screening progeny seed of step (b) for reduced lysine ketoglutarate reductase activity; and
  - (d) selecting those lines whose seeds contain reduced lysine
- 20 ketoglutarate reductase activity.
15. Seed obtained from the plant of Claim 14.
16. A nucleic acid fragment comprising
- (a) a first chimeric gene of Claim 6 or 7 and
  - (b) a second chimeric gene wherein a nucleic acid fragment
- 25 encoding dihydrodipicolinic acid synthase which is substantially insensitive to inhibition by lysine is operably linked to a plant chloroplast transit sequence and to a plant seed-specific regulatory sequence.
17. A plant comprising in its genome a first chimeric gene of Claim 6 or 7 wherein said gene reduces lysine ketoglutarate reductase activity in seeds of transformed plants and a second chimeric gene wherein a nucleic acid fragment encoding dihydrodipicolinic acid synthase which is substantially insensitive to inhibition by lysine is operably linked to a plant chloroplast transit sequence and to a plant seed-specific regulatory sequence.
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18. A plant comprising in its genome the nucleic acid fragment of
- 35 Claim 16.
19. Seed obtained from the plant of Claim 17 comprising in its genome the first and second chimeric genes.

20. Seed obtained from the plant of Claim 18 comprising in its genome the nucleic fragment of Claim 16.

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